

0059158

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

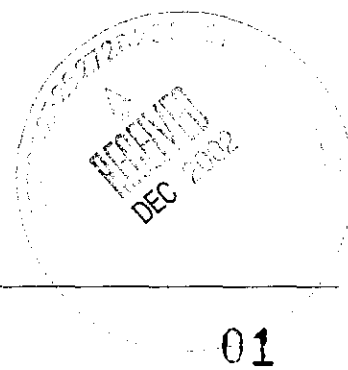
Data Package Contains 24 Pages

Report No.: 21275

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W03908	B00-030	J008D0	J2K200322-2	FDH591AF	9FDH5910	2325528

RECEIVED
APR 28 2003

EDMC



CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

December 27, 2002

Attention: Joan Kessner

AMENDED

SAF Number	:	B00-030
Date SDG Closed	:	November 20, 2002
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W03908
Data Deliverable	:	15-Day / Summary

I. Introduction

On November 20, 2002, two soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>STLR ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
FDH5L	J008D9	SOIL	11/20/02
FDH59	J008D0	SOIL	11/20/02

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy

Americium-241 by method RICH-RC-5072
Plutonium-238, -239/40 by method RICH-RC-5010
Uranium-234, 235 and 238 by method RICH-RC-5079

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Chemical Analyses

Chromium Hex by EPA method 7196A

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III. Quality Control

The analytical results for each analysis performed under SDG W03725 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Alpha Spectroscopy

Americium-241 by method RICH-RC-5072:

The first analysis batch showed signs of thorium in the alpha spectra. The laboratory contacted the client for direction and the client requested that the data be reported as is. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Uranium-234, 235 and 238 by method RICH-RC-5079:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017:

The MDA is greater than the CRDL for Co-60, Eu-152, Eu-154 and Eu-155 due to insufficient mass provided. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Chemical Analyses

Chromium Hex by EPA method 7196A:

The LCS, batch blank, sample duplicate (J008D9), matrix spike (J008D9), color (J008D9 PbCrO4) spike, and sample results are within contractual requirements.

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I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:



Barbara M. Gillespie
Project Manager

Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x, y, z, \dots)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) <i>u_c - Combined Uncertainty.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$. For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 27-Dec-02

STL Richland STLRL

Ordered by Client Sample ID, Batch No.

Report No. : 21275

SDG No: W03908

Client ID	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC MDA	RER
J008D0	FDH591AF	AM-241	2.75E-01 +- 8.6E-02		pCi/g	91.53%	1.28E-02	
J008D0 DUP	FDH591AK	AM-241	1.23E-01 +- 5.0E-02		pCi/g	108.18%	1.15E-02	3.0

Number of Results: 2

STL Richland RER - Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$ as defined by ICPT BOA.

rptSTLRchSaSum
V3.97 A97

QC Results Summary
STL Richland STLRL
 Ordered by QC Type, Batch No.

Date: 27-Dec-02

Report No. : 21275

SDG No.: W03908

QC Type	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
BLANK QC	FDMNT1AA	AM-241	9.47E-03 +- 1.3E-02	U	pCi/g	88.10%			1.28E-02
LCS	FDMNT1AC	AM-241	2.93E+00 +- 5.2E-01		pCi/g	132.66%	63.48%	-0.4	1.50E-02

Number of Results: 2

FORM I

Date: 27-Dec-02

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No. : 21275

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0

COC No. : B00-030-071

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325528	Work Order: FDH591AF	Report DB ID: 9FDH5910									
AM-241	2.75E-01	7.2E-02	8.6E-02	1.28E-02	pCi/g	91.53%	(21.4)	12/18/02 12:01 p		2.0	AMCMISO_EIE_PLT_
						1.00E+00	(6.4)			G	ALP127

Number of Results: 1

Comments:

60

FORM II

Date: 27-Dec-02

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No. : 21275

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No. : B00-030-071

Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325528	Work Order: FDH591AK			Report DB ID: FDH591KR		Orig Sa DB ID: 9FDH5910						
AM-241	1.23E-01		4.6E-02	5.0E-02	1.15E-02	pCi/g	108.18%	(10.7)	12/18/02 12:01 p		1.94	AMCMISO_EIE_PLT_
	2.75E-01	RER	3.0			1.00E+00		(4.9)			G	ALP128

Alpha Spec Result Sum = 1.2E-01

Number of Results: 1

Comments:

10

STL Richland RER - Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$ as defined by ICPT BOA.

rptSTLRchDupV3. MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

97 A97

FORM II
BLANK RESULTS

Date: 27-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-528

Report No. : 21275

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Analy Method, Primary Detector
Batch: 2325528	Work Order: FDMNT1AA		Report DB ID: FDMNT1AB									
AM-241	9.47E-03	U	1.3E-02	1.3E-02	1.28E-02	pCi/g	88.10%	0.74	12/18/02 12:02 p		2.0	AMCMISO_EIE_PLT_
						1.00E+00		(1.4)			G	ALP129

Number of Results: 1

Comments:

FORM II
LCS RESULTS

Date: 27-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-528

Report No. : 21275

Matrix: SOIL

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325528	Work Order: FDMNT1AC				Report DB ID: FDMNT1CS							
AM-241	2.93E+00	1.9E-01	5.2E-01	1.50E-02	pCi/g	132.66%	4.62E+00	4.1E-02	63.48%	12/18/02 12:02 p	2.0	AMCMISO_EIE_PLT_
						Rec Limits:	70.	130.	-0.4		G	ALP130

Number of Results: 1

Comments:

12

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: 12K200322
Client ID: BH2
Due Date: 12/11/02
QC Batch Number: 2325528
Method Test Parameter: SX-AM
Matrix: SOIL
SDG Number: W03508

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?	✓		
E. Other			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: Spectra shows Th contamination. No
Th in the Am 241 but probably a small amount under the
tracer peak. Although not much, ~ 1%, the higher trace
would give a lower than acceptable for Am 241. Client contacted
said they would resample
506895

First Level Review: Pam AndersonDate: 12-13-02

STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2325528

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?	✓		
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: The client contacted. Response is

Second Level Review: Ben M. Blythe

Date: 12/27/02

Clouseau Nonconformance Memo

SEVERN**TRENT****SERVICES**

NCM #:	J06895	Classification:	Anomaly
NCM Initiated By:	Pam Anderson	Status:	QAREVIEW
Date Opened:	12/23/02	Production Area:	Environmental - Sep
Date Closed:	N/A	Tests:	AmIso by ALP
		Lot #'s (Sample #'s):	J2K200322 (2)
		QC Batch:	2325528
Nonconformance:	Other (describe in detail)		
Subcategory:	Other (explanation required)		

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Pam Anderson	12/23/02	Spectra shows Th contamination. No Th in the Am241 ROI, but there is probably a small amount under the tracer peak. Although not much, the higher tracer would give a lower than acceptable Am 241. Client contacted. They said they would resample.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Pam Anderson	12/23/02	Client notified.

Approval History

<u>Name</u>	<u>Date Approved:</u>	<u>Position</u>
Pam Anderson	12/23/02	Group Leader

CHAIN OF CUSTODY

U-21058

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B00-030-073		Page 1 of 1	
Collector MT Stankovich / <i>Fekibary</i>		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator TRENT, SJ		Price Code 8L		Data Turnaround 21 Days	
Project Designation 100 F Area - Full Protocol		Sampling Location 116-F-6 Deep Zone Verification				SAF No. B00-030		Air Quality <input type="checkbox"/>			
Ice Chest No. <i>IRC 01.063</i>		Field Logbook No. EL-1535-7		COA R116F62000		Method of Shipment Hand Delivered/Gov't Vehicle					
Shipped To Severn Trent Incorporated, Richland		Offsite Property No. <i>NR</i>				Bill of Lading/Air Bill No. <i>NA</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive <i>TiE To 500 4m1</i> Special Handling and/or Storage <i>Cool 4c</i>			Preservation	Cool 4C	None	None	None				
			Type of Container	aG	P	aG	P				
			No. of Container(s)	1	1	1	1				
			Volume	60mL	1000mL	60mL	20mL				
<i>SDG</i> <i>W03908</i> <i>The 12-11-02</i> <i>U2K200322</i>			Chromium Hex - 71%	See item (1) in Special Instructions.	Strontium- 89,90 - Total Sr: <i>ms</i> <i>10-19-02</i>	Activity Scan					
Sample No.	Matrix *	Sample Date	Sample Time								
J008D9 <i>FRH5L</i>	SOIL	<i>11.20.02</i>	<i>0925</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS							
Relinquished By/Removed From <i>ER</i> Date/Time <i>14.29</i> <i>R. Fekibary</i> <i>11.20.02</i>				Received By/Stored In <i>40C</i> <i>11/20/02</i> <i>Rhineheart</i>							
Relinquished By/Removed From				Received By/Stored In							
Relinquished By/Removed From				Received By/Stored In							
Relinquished By/Removed From				Received By/Stored In							
Relinquished By/Removed From				Received By/Stored In							
Relinquished By/Removed From				Received By/Stored In							
LABORATORY SECTION				Received By _____ Title _____ Date/Time _____ Disposed By _____ Date/Time _____							
FINAL SAMPLE DISPOSITION				Disposed By _____ Date/Time _____							

Bechtel Hanford Inc.				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B00-030-071		Page 1 of 1		
Collector MT Stankovich <i>Fahiberg</i>				Company Contact Mike Stankovich			Telephone No. 531-7620			Project Coordinator TRENT, SJ		Price Code 8L	
Project Designation 100 F Area - Full Protocol				Sampling Location 100-F-35 Verification			SAF No. B00-030			Air Quality <input type="checkbox"/>		Data Turnaround 21 Days	
Ice Chest No. ERC 01-063				Field Logbook No. EL-1535-7			COA R10F352000			Method of Shipment Hand Delivered/Govt Vehicle			
Shipped To Severn Trent Incorporated, Richland				Offsite Property No. NA			Bill of Lading/Air Bill No. NA						
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive Tie To J00863 Special Handling and/or Storage cool 4c				Preservation	Cool 4C	None	None	None	None	None			
				Type of Container	aG	P	aG	aG	P				
				No. of Container(s)	1	1	1	1	1				
				Volume	60mL	1000mL	60mL	60mL	20mL				
SAMPLE ANALYSIS				Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Plutonium; Isotopic Uranium; Americium-241	Strontium-89,90 - Total Sr. Isotopic	Activity Seen					
Sample No.	Matrix *	Sample Date	Sample Time										
J008D0 FDH59	SOIL	11-20-02	0830	X	X	X	X	X					
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS								Matrix * S=Soil SD=Sediment SO=Solid SF=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WJ=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From <i>ERC</i> Date/Time <i>11/29/02</i> <i>R. Fahiberg</i>				Received By/Stored In <i>cool 4c</i> Date/Time <i>11/29/02</i> <i>A. Rhineheart</i>									
Relinquished By/Removed From Date/Time				Received By/Stored In Date/Time									
Relinquished By/Removed From Date/Time				Received By/Stored In Date/Time									
Relinquished By/Removed From Date/Time				Received By/Stored In Date/Time									
Relinquished By/Removed From Date/Time				Received By/Stored In Date/Time									
LABORATORY SECTION		Received By _____ Title _____ Date/Time _____											
FINAL SAMPLE DISPOSITION		Disposal Method _____ Disposed By _____ Date/Time _____											

176-F-6

VMS Gamma Spectroscopy Report generated 16-SEP-2002 14:32:11

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP RCF10490 DET1 750ML9001360_7
Sample ID : J004M1 Project Number : 116-F-6
RFC Number : RCF10490 SAF Number : B00-029
Sample Quantity : 1.17700E+03 GRAMS
Sample Type : Soil Sample Geometry :
Sample Date : 12-SEP-2002 08:20:00 Acquisition date : 16-SEP-2002 14:01:51
Decay time : 4 05:41:51.85 % dead time : 0.0%
Elapsed live time : 0 00:30:00.00 Elapsed real time : 0 00:30:00.76
Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 3-APR-2002 13:21:12.
Detector name : BEGE 3820 Counting geometry: 750 ml >900<1360
Peak Sensitivity : 3.00000
Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.663E+01	2.139E+00	4.678E-01	4.430E-02	35.54
CO-60	2.126E-01	5.157E-02	5.732E-02	5.234E-03	3.709
CS-137	1.827E+00	2.242E-01	7.257E-02	7.011E-03	25.182
EU-152	3.183E+00	2.277E-01	1.248E-01	1.468E-02	25.512
EU-154	3.103E-01	7.589E-02	9.056E-02	8.926E-03	3.426
EU-155 (5)	4.651E-03	7.285E-02	1.233E-01	1.353E-02	0.038
TL-208	1.541E-01	8.201E-02	6.502E-01	6.318E-02	0.237
PB-212	5.501E-01	1.003E-01	9.942E-02	1.093E-02	5.533
PB-214	5.815E-01	1.151E-01	1.200E-01	1.185E-02	4.849
AC-228	4.299E-01	3.128E-01	0.000E+00	0.000E+00	0.000
TH-234 (5)	7.842E-01	5.315E-01	9.307E-01	3.860E-01	0.821
U-235	8.327E-02	6.568E-02	6.393E-02	6.239E-03	1.303

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-212	3.943E-01		6.736E-01	1.068E+00	1.155E-01	0.369
BI-214	5.423E-01	+	1.688E-01	2.272E-01	2.319E-02	2.387
RA-226	1.224E+00	+	1.176E+00	1.313E+00	1.179E-01	0.932
AM-241	5.864E-02		7.127E-02	1.239E-01	1.439E-02	0.473

Approved by: [Signature]

Approval Date: 9 / 17 / 02

[Signature]

100-F-35

Gamma Spectroscopy Report generated 4-NOV-2002 09:45:02

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_RCF10608 DET1 50GRAMPILLBOX60
 Sample ID : J00863 Project Number : 100-F-35
 Sample Number : RCF10608 SAF Number : B00-029
 Sample Quantity : 6.70000E+01 GRAMS
 Sample Type : Soil Sample Geometry :
 Sample Date : 31-OCT-2002 08:15:00 Acquisition date : 4-NOV-2002 08:44:46.
 Decay time : 4 00:29:46.65 % dead time : 0.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.14
 Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 4-APR-2002 08:08:29.
 Detector name : BEGE 3820 Counting geometry: 50Gram pill box
 Peak Sensitivity : 3.00000
 Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.441E+01	4.216E+00	2.890E+00	2.868E-01	4.987
CS-137	4.730E-01	1.727E-01	1.340E-01	1.529E-02	3.531
EU-155	2.418E-02	7.948E-02	→ 1.335E-01	1.561E-02	0.181
TL-208	2.013E-01	1.688E-01	1.970E+00	2.168E-01	0.102
BI-212	2.124E+00	1.707E+00	2.285E+00	2.825E-01	0.929
PB-212	6.016E-01	1.496E-01	2.249E-01	2.585E-02	2.674
PB-214	6.617E-01	2.491E-01	2.636E-01	2.679E-02	2.510
AC-228	6.474E-01	4.721E-01	0.000E+00	0.000E+00	0.000
TH-234	9.832E-01	5.487E-01	7.355E-01	3.098E-01	1.337
AM-241	4.739E-02	8.485E-02	→ 9.839E-02	1.371E-02	0.482

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-60	2.152E-02		1.298E-01	2.739E-01	2.653E-02	0.079
EU-152	8.745E-02	+	1.357E-01	1.822E-01	2.902E-02	0.480
EU-154	6.377E-02	+	9.889E-02	1.115E-01	1.620E-02	0.572
BI-214	6.201E-01	+	3.218E-01	6.607E-01	7.583E-02	0.939
RA-226	4.734E-01		1.117E+00	2.120E+00	1.892E-01	0.223
U-235	3.071E-02		6.477E-02	1.232E-01	1.196E-02	0.249

Approved by: TIMOTHY J. SNIDER

Approval Date: 11 / 4 / 02

TIMOTHY J. SNIDER

Sample Check-in List

Date/Time Received: 11/20/02 @ 14:27 AP
 Client: BHI SDG #: W03908 NA [] SAF #: B00-030 NA []
 Work Order Number: J2K200322 Chain of Custody # B00-030-071,-073
 Shipping Container ID: ERC-01-063 Air Bill # N/A

1. Custody Seals on shipping container intact? NA [] Yes ☒ No []
2. Custody Seals dated and signed? NA [] Yes ☒ No []
3. Chain of Custody record present? Yes ☒ No []
4. Cooler temperature: 4°C NA [] 5. Vermiculite/packing materials is NA [] Wet [] Dry ☒
6. Number of samples in shipping container: 9
7. Sample holding times exceeded? NA ☒ Yes [] No []
8. Samples have:
☒ tape ☒ hazard labels
☒ custody seals ☒ appropriate samples labels
9. Samples are:
☒ in good condition ☐ leaking
☐ broken ☐ have air bubbles
 (Only for samples requiring head space)
10. Sample pH taken? NA ☒ pH < 2 [] pH > 2 []
11. Sample Location, Sample Collector Listed? * Yes ☒ No []
 *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [] No ☒
13. Description of anomalies (include sample numbers): _____

Sample Custodian: April Rutherford / Richard Date: 11/20/02

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____

12/6/02 9:35:21 AM

Sample Preparation/Analysis

Balance Id:1120373922

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

Report Due: 12/11/2002

6I PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)

SX Americium-241 by Alpha Spec

5I CLIENT: HANFORD

Pipet #:

PRIORITY

Sep DT/Tm Tech:

Batch: 2325528

SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: 2325527, 6ISO 2325527, 6ISO

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count, Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AF J2K200322-2-SAMP	2.0g,in		PATB2612 11/06/02 09/30/02		200			
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
2 FDH59-1-AK-X J2K200322-2-DUP	1.94g,in		PATB2613 11/06/02 09/30/02					
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDMNT-1-AA-B J2K210000-528-BLK	2.0g,in		PATB2614 11/06/02 09/30/02					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
4 FDMNT-1-AC-C J2K210000-528-LCS	2.0g,in		AMSJ0156 11/20/02 09/02/99					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
5 FDMNT-1-AD-BX J2K210000-528-MBLK	2.03g,in		PATB2615 11/06/02 09/30/02					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
6 FDMNT-1-AE-CM J2K210000-528-MLCS	2.0g,in		AMSJ0155 11/20/02 09/02/99					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:

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STL Richland
Richland Wa.Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2
r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 1

WO Cnt: 6
Prep_SamplePrep v4.6

12/6/02 9:35:22 AM

Sample Preparation/Analysis

Balance Id:1120373922

6I PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)

Pipet #: _____

SX Americium-241 by Alpha Spec

PRIORITY

Report Due: 12/11/2002

5I CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 2325528

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
--------------------------------------	-------------------	-----------------------------	------------------------	------------------------	-------------------	----------------	---------------------------------	--------------------------

Comments: Samples were muffled overnight. 12-06-02 GKK
Ottawa sand used for QC samples #5 FDMNT-1-AD-BX and #6 FDMNT-1-AE-CM. 12-06-02 GKK

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDH591AF-SAMP Constituent List:

Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNT1AA-BLK:											
Am-241	RDL:1	pCi/g	LCL:	UCL:	RPD:	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNT1AC-LCS:											
Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNT1AD-MBLK:											
Am-241	RDL:1	pCi/g	LCL:	UCL:	RPD:	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNT1AE-MLCS:											
Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35

FDH591AF-SAMP Calc Info:

Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNT1AA-BLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNT1AC-LCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNT1AD-MBLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNT1AE-MLCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B

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12/23/02 3:15:10 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/23/02, 12/24/02, Batch: '2325528', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
2325528				
AC	CalcC	BELSITOB	11/27/02 3:29:45 PM	
SC		WagarR	IsBatched	11/21/02 3:08:49 PM
SC		BELSITOB	InPrep	11/27/02 3:29:45 PM
SC		BELSITOB	InPrep	11/27/02 3:29:57 PM
SC		BELSITOB	Prep1C	12/2/02 2:48:35 PM
SC		BELSITOB	Prep1C	12/2/02 2:48:48 PM
SC		WAGNERJ	InPrep2	12/3/02 9:26:09 AM
SC		WAGNERJ	Prep2C	12/6/02 2:36:12 PM
SC		HAMMERL	InSep1	12/9/02 8:07:43 AM
SC		McPHERONC	InSep2	12/13/02 8:54:05 AM
SC		McPHERONC	InSep2	12/13/02 8:54:36 AM
SC		McPHERONC	Sep2C	12/13/02 8:55:12 AM
SC		BlackCL	InCnt1	12/13/02 10:12:20 AM
SC		DobeckIT	InSep2	12/17/02 12:14:52 PM
SC		DobeckIT	Sep2C	12/17/02 12:15:07 PM
SC		BlackCL	InCnt1	12/17/02 12:20:51 PM
SC		BlackCL	CalcC	12/19/02 11:39:26 AM
AC		BELSITOB	11/27/02 3:29:57 PM	
AC		BELSITOB	12/2/02 2:48:35 PM	
AC		BELSITOB	12/2/02 2:48:48 PM	
AC		WAGNERJ	12/3/02 9:26:09 AM	
AC		WAGNERJ	12/6/02 2:36:12 PM	
AC		HAMMERL	12/9/02 8:07:43 AM	
AC		McPHERONC	12/13/02 8:54:05 AM	
AC		McPHERONC	12/13/02 8:54:36 AM	
AC		McPHERONC	12/13/02 8:55:12 AM	
AC		BlackCL	12/13/02 10:12:20	
AC		DobeckIT	12/17/02 12:14:52 PM	
AC		DobeckIT	12/17/02 12:15:07 PM	
AC		BlackCL	12/17/02 12:20:51 PM	
AC		BlackCL	12/19/02 11:39:26	

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AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 58 Pages

Report No.: 21240

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W03908	B00-030	J008D0	J2K200322-2	FDH591AE	9FDH5910	2325527
		J008D0	J2K200322-2	FDH591AC	9FDH5910	2325529
		J008D0	J2K200322-2	FDH591AH	9FDH5910	2325530
		J008D0	J2K200322-2	FDH591AD	9FDH5910	2325531
		J008D0	J2K200322-2		9FDH5910	2325532
		J008D9	J2K200322-1	FDH5L1AE	9FDH5L10	2325530
		J008D9	J2K200322-1	FDH5L1AC	9FDH5L10	2325531
		J008D9	J2K200322-1		9FDH5L10	2325532

DEC

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

December 20, 2002

Attention: Joan Kessner

SAF Number	:	B00-030
Date SDG Closed	:	November 20, 2002
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W03908
Data Deliverable	:	15-Day / Summary

I. Introduction

On November 20, 2002, two soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>STLR ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
FDH5L	J008D9	SOIL	11/20/02
FDH59	J008D0	SOIL	11/20/02

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy

Americium-241 by method RICH-RC-5072
Plutonium-238, -239/40 by method RICH-RC-5010
Uranium-234, 235 and 238 by method RICH-RC-5079

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Chemical Analyses

Chromium Hex by EPA method 7196A

Bechtel Hanford, Inc.
December 20, 2002
Page 2

III. Quality Control

The analytical results for each analysis performed under SDG W03725 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Alpha Spectroscopy

Americium-241 by method RICH-RC-5072:

The first analysis batch showed signs of thorium in the alpha spectra. The Am-241 results will not be reported in this report at this time. The laboratory is awaiting direction from the client on action with respect to this analysis.

Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Uranium-234, 235 and 238 by method RICH-RC-5079:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017:

The MDA is greater than the CRDL for Co-60, Eu-152, Eu-154 and Eu-155 due to insufficient mass provided. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

Chemical Analyses


Chromium Hex by EPA method 7196A:

The LCS, batch blank, sample duplicate (J008D9), matrix spike (J008D9), color (J008D9 PbCrO4) spike, and sample results are within contractual requirements.

Bechtel Hanford, Inc.
December 20, 2002
Page 3

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:


Barbara M. Gillespie
Project Manager

Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) <i>u_c - Combined Uncertainty.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPuD}^2)]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPuD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 20-Dec-02

STL Richland STLRL

Ordered by Client Sample ID, Batch No.

Report No. : 21240

SDG No: W03908

Client ID	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC MDA	RER
J008D0	FDH591AE	PU-238	-8.72E-04 +- 1.7E-03	U	pCi/g	71.45%	2.09E-02	
		PU239/40	6.79E-02 +- 3.7E-02		pCi/g	71.45%	2.46E-02	
J008D0	FDH591AC	U-234	9.35E-01 +- 2.3E-01		pCi/g	61.38%	2.74E-02	
		U-235	2.91E-02 +- 2.4E-02		pCi/g	61.38%	1.32E-02	
		U-238	8.85E-01 +- 2.2E-01		pCi/g	61.38%	3.34E-02	
J008D0	FDH591AH	CO-60	-1.61E-02 +- 3.0E-02	U	pCi/g		5.01E-02	
		CS-137	4.18E-01 +- 7.2E-02		pCi/g		4.90E-02	
		EU-152	-1.09E-01 +- 9.9E-02	U	pCi/g		1.20E-01	
		EU-154	1.08E-02 +- 9.1E-02	U	pCi/g		1.56E-01	
		EU-155	3.94E-02 +- 8.4E-02	U	pCi/g		1.40E-01	
J008D0	FDH591AD	STRONTIUM	5.33E-01 +- 1.8E-01		pCi/g	70.80%	1.43E-01	
J008D0	9FDH5910	HEXCHROME	2.36E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	
J008D0 DUP	FDH591AJ	PU-238	0.00E+00 +- 1.1E-02	U	pCi/g	68.22%	1.22E-02	0.2
		PU239/40	7.99E-02 +- 4.0E-02		pCi/g	68.22%	2.15E-02	0.4
J008D0 DUP	FDH591AL	U-234	9.52E-01 +- 2.3E-01		pCi/g	68.04%	3.40E-02	0.1
		U-235	2.31E-02 +- 2.1E-02		pCi/g	68.04%	1.25E-02	0.4
		U-238	9.83E-01 +- 2.3E-01		pCi/g	68.04%	2.61E-02	0.6
J008D0 DUP	FDH591AM	CO-60	3.76E-02 +- 3.1E-02	U	pCi/g		5.57E-02	2.5
		CS-137	4.41E-01 +- 7.8E-02		pCi/g		4.46E-02	0.4
		EU-152	1.11E-02 +- 6.2E-02	U	pCi/g		1.07E-01	2.1
		EU-154	2.80E-02 +- 8.5E-02	U	pCi/g		1.50E-01	0.3
		EU-155	4.99E-02 +- 5.4E-02	U	pCi/g		9.41E-02	0.2
J008D0 DUP	FDH591AN	STRONTIUM	4.07E-01 +- 2.1E-01		pCi/g	31.80%	3.32E-01	0.9
J008D9	FDH5L1AE	CO-60	8.35E-03 +- 2.9E-02	U	pCi/g		5.02E-02	
		CS-137	5.62E-02 +- 3.9E-02		pCi/g		4.71E-02	
		EU-152	5.54E-02 +- 7.1E-02	U	pCi/g		1.22E-01	
		EU-154	1.90E-02 +- 9.4E-02	U	pCi/g		1.63E-01	
		EU-155	1.47E-02 +- 4.6E-02	U	pCi/g		7.72E-02	
J008D9	FDH5L1AC	STRONTIUM	1.74E+00 +- 4.9E-01		pCi/g	65.70%	1.57E-01	
J008D9	9FDH5L10	HEXCHROME	4.98E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	
J008D9 DUP	FDH5L1GR	HEXCHROME	1.84E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	

Number of Results: 31

STL Richland RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchSaSum U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.
V3.97 A97

QC Results Summary
STL Richland STLRL
 Ordered by QC Type, Batch No.

Date: 20-Dec-02

Report No. : 21240

SDG No.: W03908

QC Type	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
BLANK QC	FDMNN1AA	PU-238	0.00E+00 +- 1.6E-02	U	pCi/g	47.92%			1.77E-02
		PU239/40	1.83E-02 +- 2.3E-02	U	pCi/g	47.92%			3.12E-02
BLANK QC	FDMN01AA	U-234	-6.62E-04 +- 1.3E-03	U	pCi/g	90.32%			1.58E-02
		U-235	0.00E+00 +- 8.1E-03	U	pCi/g	90.32%			8.96E-03
		U-238	5.95E-03 +- 9.5E-03	U	pCi/g	90.32%			1.58E-02
BLANK QC	FDMN61AA	CO-60	4.17E-02 +- 1.8E-02	U	pCi/g				3.79E-02
		CS-137	7.19E-03 +- 2.0E-02	U	pCi/g				3.41E-02
		EU-152	-2.45E-02 +- 4.5E-02	U	pCi/g				7.64E-02
		EU-154	3.54E-02 +- 5.4E-02	U	pCi/g				9.86E-02
		EU-155	9.56E-03 +- 3.8E-02	U	pCi/g				6.45E-02
BLANK QC	FDMPE1AA	STRONTIUM	-1.97E-02 +- 4.9E-02	U	pCi/g	91.30%			1.22E-01
LCS	FDMNN1AC	PU239/40	3.61E+00 +- 7.4E-01		pCi/g	37.70%	104.20%	0.0	3.97E-02
LCS	FDMN01AC	U-234	1.78E+00 +- 3.7E-01		pCi/g	87.45%	108.00%	0.1	9.57E-03
		U-238	1.70E+00 +- 3.6E-01		pCi/g	87.45%	98.40%	0.0	9.57E-03
LCS	FDMN61AC	CS-137	9.23E-01 +- 1.4E-01		pCi/g				7.22E-02
LCS	FDMPE1AC	STRONTIUM	1.03E+00 +- 3.0E-01		pCi/g	85.80%	90.12%	-0.1	1.31E-01
MATRIX SPI	FDH5L1FS	HEXCHROME	3.87E+01 +- 0.0E+00		mg/kg	N/A	93.91%	-0.1	8.00E-02
LCS	FDMPN1C	HEXCHROME	3.79E+01 +- 0.0E+00		mg/L	N/A	94.84%	-0.1	2.00E-03
BLANK QC	FDMPN1B	HEXCHROME	2.00E-02 +- 0.0E+00		mg/L	N/A			2.00E-03

Number of Results: 19

FORM I

SAMPLE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.: 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0

COC No.: B00-030-071

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/ToUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Order: FDH591AE				Report DB ID: 9FDH5910							
PU-238	-8.72E-04	U	1.7E-03	1.7E-03	2.09E-02	pCi/g	71.45%	-0.04	12/13/02 01:01 p		2.0	PUISO_PLATE_AEA
							4.53E-03	1.00E+00	-1.		G	ALP37
PU239/40	6.79E-02		3.5E-02	3.7E-02	2.46E-02	pCi/g	71.45%	(2.8)	12/13/02 01:01 p		2.0	PUISO_PLATE_AEA
							6.41E-03	1.00E+00	(3.7)		G	ALP37
Batch: 2325529	Work Order: FDH591AC				Report DB ID: 9FDH5910							
U-234	9.35E-01		1.3E-01	2.3E-01	2.74E-02	pCi/g	61.38%	(34.1)	12/11/02 04:13 p		1.98	UIISO_IE_PLATE_AE
							7.15E-03	1.00E+00	(8.2)		G	ALP1
U-235	2.91E-02		2.4E-02	2.4E-02	1.32E-02	pCi/g	61.38%	(2.2)	12/11/02 04:13 p		1.98	UIISO_IE_PLATE_AE
							1.00E+00	(2.4)			G	ALP1
U-238	8.85E-01		1.3E-01	2.2E-01	3.34E-02	pCi/g	61.38%	(26.5)	12/11/02 04:13 p		1.98	UIISO_IE_PLATE_AE
							1.01E-02	1.00E+00	(8.1)		G	ALP1
Ratio U-234/238 = 1.1												
Batch: 2325530	Work Order: FDH591AH				Report DB ID: 9FDH5910							
CO-60	-1.61E-02	U	3.0E-02	3.0E-02	5.01E-02	pCi/g		-0.32	12/3/02 10:08 a		44.9	GAMMA_GS
							5.00E-02	-(1.1)			g	GER2\$1
CS-137	4.18E-01		7.2E-02	7.2E-02	4.90E-02	pCi/g		(8.5)	12/3/02 10:08 a		44.9	GAMMA_GS
							1.00E-01	(11.6)			g	GER2\$1
EU-152	-1.09E-01	U	9.9E-02	9.9E-02	1.20E-01	pCi/g		-0.91	12/3/02 10:08 a		44.9	GAMMA_GS
							1.00E-01	-(2.2)			g	GER2\$1
EU-154	1.08E-02	U	9.1E-02	9.1E-02	1.56E-01	pCi/g		0.07	12/3/02 10:08 a		44.9	GAMMA_GS
							1.00E-01	0.24			g	GER2\$1

FORM I

SAMPLE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No. : 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0

COC No. : B00-030-071

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
EU-155	3.94E-02	U	8.4E-02	8.4E-02	1.40E-01	pCi/g		0.28 1.00E-01	12/3/02 10:08 a		44.9 g	GAMMA_GS GER2\$1
Batch: 2325531	Work Order: FDH591AD			Report DB ID: 9FDH5910								
STRONTIUM	5.33E-01		1.1E-01	1.8E-01	1.43E-01	pCi/g	70.80%	(3.7) (6.)	12/11/02 07:54 a		6.02 G	SRTOT_SEP_PRECIP GPC31B
Batch: 2325532	Work Order:			Report DB ID: 9FDH5910								
HEXCHROME	2.36E-01			0.0E+00	8.00E-02	mg/kg	N/A	(3.) N/A	12/4/02		2.5 G	EPA7196

Number of Results: 12

Comments:

FORM I

SAMPLE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 9:25:00 AM

Lot-Sample No.: J2K200322-1

Report No. : 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D9

COC No. : B00-030-073

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Order: FDH5L1AE				Report DB ID: 9FDH5L10							
CO-60	8.35E-03	U	2.9E-02	2.9E-02	5.02E-02	pCi/g		0.17	12/3/02 10:09 a		42.8	GAMMA_GS
							5.00E-02	0.58			g	GER5\$1
CS-137	5.62E-02		3.9E-02	3.9E-02	4.71E-02	pCi/g		(1.2)	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	(2.9)			g	GER5\$1
EU-152	5.54E-02	U	7.1E-02	7.1E-02	1.22E-01	pCi/g		0.45	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	(1.6)			g	GER5\$1
EU-154	1.90E-02	U	9.4E-02	9.4E-02	1.63E-01	pCi/g		0.12	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	0.4			g	GER5\$1
EU-155	1.47E-02	U	4.6E-02	4.6E-02	7.72E-02	pCi/g		0.19	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	0.64			g	GER5\$1
Batch: 2325531	Work Order: FDH5L1AC				Report DB ID: 9FDH5L10							
STRONTIUM	1.74E+00		1.9E-01	4.9E-01	1.57E-01	pCi/g	65.70%	(11.1)	12/11/02 07:54 a		6.02	SRTOT_SEP_PRECIP
						7.29E-02		(7.1)			G	GPC31A
Batch: 2325532	Work Order:				Report DB ID: 9FDH5L10							
HEXCHROME	4.98E-01			0.0E+00	8.00E-02	mg/kg	N/A	(6.2)	12/4/02		2.5	EPA7196
								N/A			G	

Number of Results: 7

Comments:

10

FORM I
SAMPLE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 9:25:00 AM

Lot-Sample No.: J2K200322-1

Report No. : 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D9

COC No. : B00-030-073

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
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11

FORM II

Date: 20-Dec-02

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.: 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No.: B00-030-071

Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Order: FDH591AJ			Report DB ID: FDH591JR		Orig Sa DB ID: 9FDH5910						
PU-238	0.00E+00	U	0.0E+00	1.1E-02	1.22E-02	pCi/g	68.22%	0.	12/13/02 01:01 p		1.94	UIISO_PLATE_AEA
	-8.72E-04	U RER	0.2			1.00E+00		0.			G	ALP38
PU239/40	7.99E-02		3.8E-02	4.0E-02	2.15E-02	pCi/g	68.22%	(3.7)	12/13/02 01:01 p		1.94	UIISO_PLATE_AEA
	6.79E-02	RER	0.4			1.00E+00		(4.)			G	ALP38
Alpha Spec Result Sum = 8.0E-02												
Batch: 2325529	Work Order: FDH591AL			Report DB ID: FDH591LR		Orig Sa DB ID: 9FDH5910						
U-234	9.52E-01		1.3E-01	2.3E-01	3.40E-02	pCi/g	68.04%	(28.)	12/11/02 04:13 p		1.92	UIISO_IE_PLATE_AE
	9.35E-01	RER	0.1			1.00E+00		(8.3)			G	ALP2
U-235	2.31E-02		2.1E-02	2.1E-02	1.25E-02	pCi/g	68.04%	(1.8)	12/11/02 04:13 p		1.92	UIISO_IE_PLATE_AE
	2.91E-02	RER	0.4			1.00E+00		(2.2)			G	ALP2
U-238	9.83E-01		1.3E-01	2.3E-01	2.61E-02	pCi/g	68.04%	(37.6)	12/11/02 04:13 p		1.92	UIISO_IE_PLATE_AE
	8.85E-01	RER	0.6			1.00E+00		(8.4)			G	ALP2
Ratio U-234/238 = 1.0												
Alpha Spec Result Sum = 2.0E+00												
Batch: 2325530	Work Order: FDH591AM			Report DB ID: FDH591MR		Orig Sa DB ID: 9FDH5910						
CO-60	3.76E-02	U	3.1E-02	3.1E-02	5.57E-02	pCi/g		0.68	12/4/02 10:59 a		44.9	GAMMA_GS
	-1.61E-02	U RER	2.5			5.00E-02		(2.5)			g	GER4\$1
CS-137	4.41E-01		7.8E-02	7.8E-02	4.46E-02	pCi/g		(9.9)	12/4/02 10:59 a		44.9	GAMMA_GS
	4.18E-01	RER	0.4			1.00E-01		(11.3)			g	GER4\$1
EU-152	1.11E-02	U	6.2E-02	6.2E-02	1.07E-01	pCi/g		0.1	12/4/02 10:59 a		44.9	GAMMA_GS
	-1.09E-01	U RER	2.1			1.00E-01		0.36			g	GER4\$1
EU-154	2.80E-02	U	8.5E-02	8.5E-02	1.50E-01	pCi/g		0.19	12/4/02 10:59 a		44.9	GAMMA_GS
	1.08E-02	U RER	0.3			1.00E-01		0.66			g	GER4\$1

12

STL Richland RER - Replicate Error Ratio = $(S-D)/[\sqrt{(sq(TPU_s)+sq(TPU_d))}]$ as defined by ICPT BOA.

rptSTLRchDupV3. MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

97 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 20-Dec-02

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.: 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No.: B00-030-071

Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
EU-155	4.99E-02	U	5.4E-02	5.4E-02	9.41E-02	pCi/g		0.53	12/4/02 10:59 a		44.9	GAMMA_GS
	3.94E-02	U RER	0.2			1.00E-01		(1.9)			g	GER4\$1
Batch: 2325531	Work Order: FDH591AN		Report DB ID: FDH591NR		Orig Sa DB ID: 9FDH5910							
STRONTIUM	4.07E-01		1.8E-01	2.1E-01	3.32E-01	pCi/g	31.80%	(1.2)	12/11/02 07:54 a		6.0	SRTOT_SEP_PRECIP
	5.33E-01	RER	0.9					(3.9)			G	GPC31C

Number of Results: 11

Comments:

13

STL Richland

rptSTLRchDupV3.
97 A97RER - Replicate Error Ratio = $(S-D)/[\sqrt{(sq(TPU_s)+sq(TPU_d))}]$ as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 20-Dec-02

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W03908

Collection Date: 11/20/2002 9:25:00 AM

Lot-Sample No.: J2K200322-1

Report No. : 21240

Received Date: 11/20/2002 2:29:00 PM

Client Sample ID: J008D9 DUP

COC No. : B00-030-073

Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Order:			Report DB ID: FDH5L1GR		Orig Sa DB ID: 9FDH5L10						
HEXCHROME	1.84E-01			0.0E+00	8.00E-02	mg/kg	N/A	(2.3)	12/4/02		2.5	EPA7196
	4.98E-01	RPD	0.9					N/A			G	

Number of Results: 1

Comments:

STL Richland

RER - Replicate Error Ratio = $(S-D)/(\sqrt{(sq(TPUs)+sq(TPUd))})$ as defined by ICPT BOA.

rptSTLRchDupV3.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

97 A97

FORM II
BLANK RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: #Error

Report No. : 21240

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Order:				Report DB ID: FDMPN1B							
HEXCHROME	2.00E-02			0.0E+00	2.00E-03	mg/L	N/A	(10.) N/A	12/4/02		100.0 ML	EPA7196

Number of Results: 1

Comments:

FORM II

Date: 20-Dec-02

BLANK RESULTS

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-527

Report No.: 21240

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Order: FDMNN1AA				Report DB ID: FDMNN1AB							
PU-238	0.00E+00	U	0.0E+00	1.6E-02	1.77E-02	pCi/g	47.92%	0.	12/13/02 01:02 p		2.0	PUISO_PLATE_AEA
						1.00E+00		0.			G	ALP39
PU239/40	1.83E-02	U	2.3E-02	2.3E-02	3.12E-02	pCi/g	47.92%	0.58	12/13/02 01:02 p		2.0	PUISO_PLATE_AEA
					6.78E-03	1.00E+00		(1.6)			G	ALP39

Number of Results: 2

Comments:

16

STL Richland

rptSTLRchBlank

V3.97 A97

MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II
BLANK RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-529

Report No. : 21240

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325529	Work Order: FDMN01AA			Report DB ID: FDMN01AB								
U-234	-6.62E-04	U	1.3E-03	1.3E-03	1.58E-02	pCi/g	90.32%	-0.04	12/11/02 04:14 p		2.0	UIISO_IE_PLATE_AE
					3.44E-03	1.00E+00		-1.			G	ALP9
U-235	0.00E+00	U	0.0E+00	8.1E-03	8.96E-03	pCi/g	90.32%	0.	12/11/02 04:14 p		2.0	UIISO_IE_PLATE_AE
						1.00E+00		0.			G	ALP9
U-238	5.95E-03	U	9.4E-03	9.5E-03	1.58E-02	pCi/g	90.32%	0.38	12/11/02 04:14 p		2.0	UIISO_IE_PLATE_AE
					3.44E-03	1.00E+00		(1.3)			G	ALP9

Ratio U-234/238 = -0.1

Number of Results: 3

Comments:

17

FORM II

Date: 20-Dec-02

BLANK RESULTS

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-530

Report No. : 21240

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Order: FDMN61AA			Report DB ID: FDMN61AX								
CO-60	4.17E-02	U	1.8E-02	1.8E-02	3.79E-02	pCi/g		(1.1)	12/3/02 10:10 a		52.0	GAMMA_GS
						5.00E-02		(4.6)			g	GER4\$1
CS-137	7.19E-03	U	2.0E-02	2.0E-02	3.41E-02	pCi/g		0.21	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		0.73			g	GER4\$1
EU-152	-2.45E-02	U	4.5E-02	4.5E-02	7.64E-02	pCi/g		-0.32	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		-(1.1)			g	GER4\$1
EU-154	3.54E-02	U	5.4E-02	5.4E-02	9.86E-02	pCi/g		0.36	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		(1.3)			g	GER4\$1
EU-155	9.56E-03	U	3.8E-02	3.8E-02	6.45E-02	pCi/g		0.15	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		0.51			g	GER4\$1

Number of Results: 5

Comments:

FORM II
BLANK RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-531

Report No. : 21240

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325531	Work Order: FDMPE1AA				Report DB ID: FDMPE1AB							
STRONTIUM	-1.97E-02	U	4.8E-02	4.9E-02	1.22E-01	pCi/g	91.30%	-0.16	12/11/02 07:54 a		6.0	SRTOT_SEP_PRECIP
					5.64E-02			-0.81			G	GPC31D

Number of Results: 1

Comments:

19

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: #Error

Report No. : 21240

Matrix: WATER

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Order:	Report DB ID: FDMPN1C										
HEXCHROME	3.79E+01		0.0E+00	2.00E-03	mg/L	N/A	4.00E+01		94.84%	12/4/02	100.0	EPA7196
Rec Limits:											ML	

Number of Results: 1

Comments:

20

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-527

Report No. : 21240

Matrix: SOIL

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Order: FDMNN1AC	Report DB ID: FDMNN1CS										
PU239/40	3.61E+00	3.5E-01	7.4E-01	3.97E-02	pCi/g	37.70%	3.46E+00	1.7E-01	104.20%	12/13/02 01:02 p	2.0	PUISO_PLATE_AEA
Rec Limits:							70.	130.	0.0		G	ALP41

Number of Results: 1

Comments:

21

FORM II

LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-529

Report No. : 21240

Matrix: SOIL

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Defector
Batch: 2325529	Work Order: FDMN01AC	Report DB ID: FDMN01CS										
U-234	1.78E+00	1.6E-01	3.7E-01	9.57E-03	pCi/g	87.45%	1.65E+00	1.1E-02	108.00%	12/11/02 04:14 p	2.0	UIISO_IE_PLATE_AE
						Rec Limits:	70.	130.	0.1		G	ALP10
U-238	1.70E+00	1.5E-01	3.6E-01	9.57E-03	pCi/g	87.45%	1.72E+00	1.1E-02	98.40%	12/11/02 04:14 p	2.0	UIISO_IE_PLATE_AE
						Rec Limits:	70.	130.	0.0		G	ALP10

Number of Results: 2

Comments:

22

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-530

Report No. : 21240

Matrix: SOIL

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Order: FDMN61AC				Report DB ID: FDMN61CM							
CS-137	9.23E-01	1.4E-01	1.4E-01	7.22E-02	pCi/g					12/4/02 10:58 a	26.61	GAMMA_GS
						Rec Limits:	70.	130.			g	GER2\$1

Number of Results: 1

Comments:

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K210000-531

Report No. : 21240

Matrix: SOIL

Parameter	Result	Count Qual Error (2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325531	Work Order: FDMPE1AC	Report DB ID: FDMPE1CS										
STRONTIUM	1.03E+00	1.3E-01	3.0E-01	1.31E-01	pCi/g	85.80%	1.14E+00	2.2E-02	90.12%	12/11/02 07:55 a	6.0	SRTOT_SEP_PRECIP
Rec Limits:							70.	130.	-0.1		G	GPC32A

Number of Results: 1

Comments:

24

FORM II
MATRIX SPIKE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03908

Lot-Sample No.: J2K200322-1

Report No. : 21240

Matrix: SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MD	Rpt Unit, CRDL	Yield	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Order:			Report DB ID: FDH5L1FS		Orig Sa DB ID: 9FDH5L10							
HEXCHROME	3.87E+01			0.0E+00	8.00E-02	mg/kg	N/A	93.91%	4.12E+01		12/4/02	2.5	EPA7196
	4.98E-01	RPD	1.9									G	

Number of Results: 1

Comments:

25

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J2K200372 P
 Client ID: BITZ
 Due Date: 12/11/02
 QC Batch Number: 2325527
 Method Test Parameter: SOIL
 Matrix: SOIL
 SDG Number: W0350Y

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?	✓		
E. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: Pam Anderson

Date: 12-15-02



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2325527

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?	✓		
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: shmburgh

Date: 12/14/02

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: 1212008322 P
 Client ID: BHE
 Due Date: 12/11/02
 QC Batch Number: 2325829
 Method Test Parameter: SR-MSD
 Matrix: Soil
 SDG Number: 114 W03908

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?	✓		
E. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: Pam Anderson

Date: 12-13-02



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

OC Batch Number: 2325529

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			✓
1. Are all Nonconformances included and noted?			
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: nm mtrij

Date: 12/13/02

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J2K 200322

Client ID: BHE

Due Date: 12-11-02

QC Batch Number: 2325530

Method Test Parameter: Gamma

Matrix: Soil

SDG Number: W03908

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓	✓	
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?			✓
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓	✓	
3. Are the MS/MSD results, yields and MDAs within contract limits?		✓	✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓	✓	
5. Are the sample yields and MDAs within contract limits?	✓	✓	
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?			✓
E. Other			
1. Are all Nonconformances included and noted? J06766	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response:

First Level Review: [Signature]

Date: 12-8-02

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2 325 530

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?			—
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			—
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?			
8. Do the MS/MSD results and yields meet acceptance criteria?			—
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?	✓		fold 12/12/02
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?			—
5. Were all calculations checked at a minimum frequency?			—
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: _____

Joe Scott

Date: 12/12/02

Clouseau Nonconformance Memo

SEVERN
TRENT
SERVICES

NCM #:	J06766	Classification:	Anomaly
NCM Initiated By:	Dale OConnell	Status:	QAREVIEW
Date Opened:	12/09/02	Production Area:	Environmental - Prep
Date Closed:	N/A	Tests:	Gamma by GER
		Lot #'s (Sample #'s):	J2K200322 (1,2)
		QC Batch:	2325530
Nonconformance:	QC Result Out of Limits		
Subcategory:	MDA exceeds RDL		

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Dale OConnell	12/09/02	Cause: Insufficient mass. Isotopes affected: Co-60, Eu-152,-154 and/or -155. All requested radionuclides unavailable in geometry created.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Dale OConnell	12/09/02	Count time maximized, MDA achieved on the blank. Report results.

Approval History

<u>Name</u>	<u>Date Approved:</u>	<u>Position</u>
Dale OConnell	12/09/02	Group Leader

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J2K2W322
 Client ID: BH2
 Due Date: 12/11/02
 QC Batch Number: 2325531
 Method Test Parameter: TH-75R
 Matrix: SOL
 SDG Number: W03908

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?	✓		
4. Were spectra reviewed/meet contractual requirements?			✓
5. Were raw counts reviewed for anomalies?	✓		
E. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: Pam Anderson

Date: 12-1-02



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2325531

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?			✓
5. Were all calculations checked at a minimum frequency?			✓
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: _____

Jim Scott

Date: 12/12/02

SEVERN**TRENT****SERVICES**

Richland Laboratory
Data Review Check List
METALS

D.H.

Work Order Number(s): FDH5L, FDH59				
Lab Sample Numbers or SDG: W03908 2325532				
Method/Test/Parameter: Cr+16 in soil RICHWC 5005 R6				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	✓			✓
2. Correlation coefficient within QC limits?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			✓
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	✓			✓
2. Were all sample holding times met?	✓			✓
D. QC Samples				
1. All results for the preparation blank below limits?	✓			✓
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	✓			✓
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			✓
4. Analytical spikes within QC limits where applicable?	✓			✓
5. ICP only: One serial dilution performed per SDG?			✓	✓
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	✓
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	✓



STL

Data Review Checklist
~~RADIO~~CHEMISTRY
Second Level Review

QC Batch Number: 232 5532

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?			✓
3. Are the correct isotopes reported?			✓
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?			✓
2. Does the blank result meet the Contract criteria?			
3. Is the blank result < the Contract Detection Limit?	✓		✓
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?			✓
8. Do the MS/MSD results and yields meet acceptance criteria?	✓		
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: *Ben M. Dwyer* Date: 12/13/02

CHAIN OF CUSTODY

Bechtel Hanford Inc.				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								B00-030-073		Page 1 of 1						
Collector MT Stankovich / Fehibery				Company Contact Mike Stankovich				Telephone No. 531-7620				Project Coordinator TRENT, SJ				Price Code 8L		Data Turnaround 21 Days		
Project Designation 100 F Area - Full Protocol				Sampling Location 116-F-6 Deep Zone Verification				SAF No. B00-030				Air Quality <input type="checkbox"/>								
Ice Chest No. IRC 01.063				Field Logbook No. EL-1535-7				COA R116F62000				Method of Shipment Hand Delivered/Gov't Vehicle								
Shipped To Savern Trent Incorporated, Richland				Offsite Property No. NP				Bill of Lading/Air Bill No. NA												
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive TIE TO J004m1 Special Handling and/or Storage Cooler				Preservation		Cool 4C	None	None	None											
				Type of Container		aG	P	aG	P											
				No. of Container(s)		1	1	1	1											
				Volume		60mL	1000mL	60mL	20mL											
SDG W03908 The 12-11-02 SAMPLE ANALYSIS JK200322				Chromium Hex - 7196		See item (I) in Special Instructions.		Strontium-89,90 - Total Sr; [redacted] mCi 10-29-02		Activity Scan										
Sample No.		Matrix *		Sample Date		Sample Time														
J008D9 FDH5L		SOIL		11-20-02		0925		X	X	X	X									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS										Matrix *		
Relinquished By/Removed From ER Date/Time 11-20-02				Received By/Stored In P. Fehibery Date/Time 11-20-02				(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}										S=Soil SB=Sediment SO=Solid SL=Sludge W = Water O=Oil A=Air DS=Dry Solid DL=Dry Liquid TL=Liquid V=Vegetation X=Other		
Relinquished By/Removed From R. Fehibery Date/Time 11-20-02				Received By/Stored In Rhineheart Date/Time 11-20-02																
Relinquished By/Removed From				Received By/Stored In																
Relinquished By/Removed From				Received By/Stored In																
Relinquished By/Removed From				Received By/Stored In																
Relinquished By/Removed From				Received By/Stored In																
Relinquished By/Removed From				Received By/Stored In																
LABORATORY SECTION				Received By				Title				Date/Time								
FINAL SAMPLE DISPOSITION				Disposal Method				Disposed By				Date/Time								

Bechtel Hanford Inc.				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B00-030-071		Page 1 of 1													
Collector MT Stankovich <i>Fehlbauer</i>				Company Contact Mike Stankovich				Telephone No. 531-7620				Project Coordinator TRENT, SJ		Price Code 8L		Data Turnaround 21 Days									
Project Designation 100 F Area - Full Protocol				Sampling Location 100-F-35 Verification				SAF No. B00-030				Air Quality <input type="checkbox"/>													
Ice Chest No. ERC 01.063				Field Logbook No. EL-1535-7				COA R10F352000				Method of Shipment Hand Delivered/Gov't Vehicle													
Shipped To Severn Trent Incorporated, Richland				Offsite Property No. NA				Bill of Lading/Air Bill No. NA																	
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive <i>Tic To J20863</i> Special Handling and/or Storage <i>cool 4c</i>														Preservation Cool 4C		None		None		None		None			
														Type of Container aG		P		aG		aG		P			
														No. of Container(s) 1		1		1		1		1			
														Volume 60mL		1000mL		60mL		60mL		20mL			
SAMPLE ANALYSIS														Chromium Hex - 7196		See item (1) in Special Instructions.		Isotopic Plutonium; Isotopic Uranium; Americium-241		Strontium- 89,90 - Total Sr, <i>[redacted]</i>		Activity Scan			
Sample No.		Matrix *		Sample Date		Sample Time																			
J008D0 <i>FDH59</i>		SOIL		<i>11-20-02</i>		<i>0830</i>		<i>X</i>		<i>X</i>		<i>X</i>		<i>X</i>		<i>X</i>									
CHAIN OF POSSESSION														SPECIAL INSTRUCTIONS (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)											
Relinquished By/Removed From <i>ERC</i> Date/Time <i>11/29/02</i> <i>R. Fehlbauer</i>														Received By/Stored In <i>11/29/02</i> Date/Time <i>14:59</i> <i>A. Rhineheart</i>											
Relinquished By/Removed From Date/Time														Received By/Stored In Date/Time											
Relinquished By/Removed From Date/Time														Received By/Stored In Date/Time											
Relinquished By/Removed From Date/Time														Received By/Stored In Date/Time											
Relinquished By/Removed From Date/Time														Received By/Stored In Date/Time											
Relinquished By/Removed From Date/Time														Received By/Stored In Date/Time											
LABORATORY SECTION		Received By _____ Title _____ Date/Time _____																							
FINAL SAMPLE DISPOSITION		Disposal Method _____ Disposed By _____ Date/Time _____																							

Matrix *

- S=Soil
- SB=Sediment
- SO=Solid
- SL=Sludge
- W=Water
- O=Oil
- A=Air
- DE=Drum Solids
- DL=Drum Liquids
- T=Time
- WT=Wipe
- L=Liquid
- V=Vegetation
- X=Other

176-F-6

VMS Gamma Spectroscopy Report generated 16-SEP-2002 14:32:11

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP RCF10490 DET1 750ML9001360_7
 Sample ID : J004M1 Project Number : 116-F-6
 RFC Number : RCF10490 SAF Number : B00-029
 Sample Quantity : 1.17700E+03 GRAMS
 Sample Type : Soil Sample Geometry :
 Sample Date : 12-SEP-2002 08:20:00 Acquisition date : 16-SEP-2002 14:01:51
 Decay time : 4 05:41:51.85 % dead time : 0.0%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.76
 Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 3-APR-2002 13:21:12.
 Detector name : BEGE 3820 Counting geometry: 750 ml >900<1360
 Peak Sensitivity : 3.00000
 Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.663E+01	2.139E+00	4.678E-01	4.430E-02	35.54
CO-60	2.126E-01	5.157E-02	5.732E-02	5.234E-03	3.70
CS-137	1.827E+00	2.242E-01	7.257E-02	7.011E-03	25.18
EU-152	3.183E+00	2.277E-01	1.248E-01	1.468E-02	25.51
EU-154	3.103E-01	7.589E-02	9.056E-02	8.926E-03	3.42
EU-155	4.651E-01	7.285E-02	→ 1.233E-01	1.353E-02	0.038
TL-208	1.541E-01	8.201E-02	6.502E-01	6.318E-02	0.237
PB-212	5.501E-01	1.003E-01	9.942E-02	1.093E-02	5.53
PB-214	5.815E-01	1.151E-01	1.200E-01	1.185E-02	4.84
AC-228	4.299E-01	3.128E-01	0.000E+00	0.000E+00	0.000
TH-234	7.642E-01	5.515E-01	→ 9.307E-01	3.860E-01	0.821
U-235	8.327E-02	6.568E-02	6.393E-02	6.239E-03	1.303

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-212	3.943E-01		6.736E-01	1.068E+00	1.155E-01	0.369
BI-214	5.423E-01	+	1.688E-01	2.272E-01	2.319E-02	2.387
RA-226	1.224E+00	+	1.176E+00	1.313E+00	1.179E-01	0.932
AM-241	5.864E-02		7.127E-02	1.239E-01	1.439E-02	0.473

Approved by: [Signature]
 P. Snider

Approval Date: 9 / 17 / 02

100-F-35

Gamma Spectroscopy Report generated 4-NOV-2002 09:45:02

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP RCF10608 DET1 50GRAMPILLBOX60
 Sample ID : J00863 Project Number : 100-F-35
 Sample Number : RCF10608 SAF Number : B00-029
 Sample Quantity : 6.70000E+01 GRAMS
 Sample Type : Soil Sample Geometry :
 Sample Date : 31-OCT-2002 08:15:00 Acquisition date : 4-NOV-2002 08:44:46.
 Decay time : 4 00:29:46.65 % dead time : 0.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.14
 Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 4-APR-2002 08:08:29.
 Detector name : BEGE 3820 Counting geometry: 50Gram pill box
 Peak Sensitivity : 3.00000
 Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.441E+01	4.216E+00	2.890E+00	2.868E-01	4.987
CS-137	4.730E-01	1.727E-01	1.340E-01	1.529E-02	3.531
EU-155	2.418E-02	7.948E-02	→ 1.335E-01	1.561E-02	0.181
TL-208	2.013E-01	1.688E-01	1.970E+00	2.168E-01	0.102
BI-212	2.124E+00	1.707E+00	2.285E+00	2.825E-01	0.929
PB-212	6.016E-01	1.496E-01	2.249E-01	2.585E-02	2.674
PB-214	6.617E-01	2.491E-01	2.636E-01	2.679E-02	2.510
AC-228	6.474E-01	4.721E-01	0.000E+00	0.000E+00	0.000
TH-234	9.832E-01	5.487E-01	7.355E-01	3.098E-01	1.337
AM-241	4.739E-02	8.405E-02	→ 9.839E-02	1.371E-02	0.482

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-60	2.152E-02		1.298E-01	2.739E-01	2.653E-02	0.079
EU-152	8.745E-02	+	1.357E-01	1.822E-01	2.902E-02	0.480
EU-154	6.377E-02	+	9.889E-02	1.115E-01	1.620E-02	0.572
BI-214	6.201E-01	+	3.218E-01	6.607E-01	7.583E-02	0.939
RA-226	4.734E-01		1.117E+00	2.120E+00	1.892E-01	0.223
U-235	3.071E-02		6.477E-02	1.232E-01	1.196E-02	0.249

Approved by:

TIMOTHY J. SNIDER

Approval Date: 11 / 4 / 02

Sample Check-in List

Date/Time Received: 11/20/02 @ 14:27 AR
 Client: BHI SDG #: W03908 NA ☐ SAF #: B00-030 NA ☐
 Work Order Number: J2K200322 Chain of Custody # B00-030-071,-073
 Shipping Container ID: ERC-01-063 Air Bill # N/A

1. Custody Seals on shipping container intact? NA ☐ Yes ☒ No ☐
2. Custody Seals dated and signed? NA ☐ Yes ☒ No ☐
3. Chain of Custody record present? Yes ☒ No ☐
4. Cooler temperature: 4°C NA ☐ 5. Vermiculite/packing materials is NA ☐ Wet ☐ Dry ☒
6. Number of samples in shipping container: 9
7. Sample holding times exceeded? NA ☒ Yes ☐ No ☐
8. Samples have:
☒ tape ☒ hazard labels
☒ custody seals ☒ appropriate samples labels
9. Samples are:
☒ in good condition ☐ leaking
☐ broken ☐ have air bubbles
 (Only for samples requiring head space)
10. Sample pH taken? NA ☒ pH < 2 ☐ pH > 2 ☐
11. Sample Location, Sample Collector Listed? * Yes ☒ No ☐
 *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes ☐ No ☒
13. Description of anomalies (include sample numbers): _____

Sample Custodian: April Rhineland / Rick Wal Date: 11/20/02

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____

12/6/02 9:26:01 AM

Sample Preparation/Analysis

Balance Id:1120373922

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.6I PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)
SO Plutonium-238,239/40 by Alpha Spec
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 12/11/2002 W03908

PRIORITY

Sep1 DT/Tm Tech:

Batch: 2325527 SOIL pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: 2325528, 6ISX 2325528, 6ISX

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AE J2K200322-2-SAMP	2.0g,in	PATB2612	11/06/02 09/30/02 r		260			
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
2 FDH59-1-AJ-X J2K200322-2-DUP	1.94g,in	PATB2613	11/06/02 09/30/02 r					
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDMNN-1-AA-B J2K210000-527-BLK	2.0g,in	PATB2614	11/06/02 09/30/02 r					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
4 FDMNN-1-AC-C J2K210000-527-LCS	2.0g,in	PUSK0505	09/20/02 05/31/02 r					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
5 FDMNN-1-AD-BX J2K210000-527-MBLK	2.03g,in	PATB2615	11/06/02 09/30/02 r					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:
6 FDMNN-1-AE-CM J2K210000-527-MLCS	2.0g,in	PUSK0504	09/20/02 05/31/02 r					
11/20/2002 08:30	AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:

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12/6/02 9:26:02 AM

Sample Preparation/Analysis

Balance Id:1120373922

6I PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)
 SO Plutonium-238,239/40 by Alpha Spec
 5I CLIENT: HANFORD

Pipet #:

Report Due: 12/11/2002

PRIORITY

Sep1 DT/Tm Tech:

Batch: 2325527

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
--------------------------------------	-------------------	-----------------------------	------------------------	------------------------	-------------------	----------------	---------------------------------	--------------------------

Comments: Samples were muffled overnight. 12-06-02 GEX
 Ottawa sand used for QC samples #5 FDMNN-1-AD-BX and #6 FDMNN-1-AE-CLM.
 12-06-02 GEX

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BGL, 27038

FDH591AE-SAMP Constituent List:

PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						
FDMNN1AA-BLK:											
PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:	UCL:	RPD:
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						
FDMNN1AC-LCS:											
PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNN1AD-MBLK:											
PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:	UCL:	RPD:
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						
FDMNN1AE-MLCS:											
PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35

FDH591AE-SAMP Calc Info:

Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNN1AA-BLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNN1AC-LCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNN1AD-MBLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
FDMNN1AE-MLCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B

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STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

Richland Wa. r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 2

 WO Cnt: 6
 Prep_SamplePrep v4.6

12/16/02 8:08:28 AM

ICOC Fraction Transfer/Status Report

ByDate: 11/16/02, 12/17/02, Batch: '2325527', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
2325527				
AC	CalcC	WAGNERJ	12/3/02 9:25:51 AM	
SC		WagarR	IsBatched	11/21/02 3:10:30 PM
SC		WAGNERJ	InPrep2	12/3/02 9:25:51 AM
SC		WAGNERJ	Prep2C	12/6/02 2:36:18 PM
SC		HAMMERL	InSep1	12/9/02 8:07:49 AM
SC		BlackCL	InCnt1	12/13/02 10:12:26 AM
SC		BlackCL	CalcC	12/14/02 9:02:23 AM
AC		WAGNERJ	12/6/02 2:36:18 PM	
AC		HAMMERL	12/9/02 8:07:49 AM	
AC		BlackCL	12/13/02 10:12:26	
AC		BlackCL	12/14/02 9:02:23 AM	

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AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

12/6/02 9:34:22 AM

Sample Preparation/Analysis

Balance Id:1120373922

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.7S Uiso PrpRC5013/RC5019, SepRC5079(5039)
SR Uranium-234,235,238 by Alpha Spec
SI CLIENT: HANFORD

Pipet #: _____

Report Due: 12/11/2002 W03908

PRIORITY

Sep1 DT/Tm Tech:

Batch: 2325529 SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AC J2K200322-2-SAMP	1.98g,in		UITS8374 11/13/02 10/05/02		300			
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5					Scr Rst: Alpha: 9.47E+00 pCi/g Beta: 2.39E+01 pCi/g	
2 FDH59-1-AL-X J2K200322-2-DUP	1.92g,in		UITS8375 11/13/02 10/05/02					
11/20/2002 08:30	AmtRec: LP,3X60G,20ML	#Containers: 5					Scr Rst: Alpha: 9.47E+00 pCi/g Beta: 2.39E+01 pCi/g	
3 FDMN0-1-AA-B J2K210000-529-BLK	2.0g,in		UITS8376 11/13/02 10/05/02					
11/20/2002 08:30	AmtRec:	#Containers: 1					Scr Rst: Alpha: Beta:	
4 FDMN0-1-AC-C J2K210000-529-LCS	2.0g,in		UISH0153 10/13/02 05/06/02					
11/20/2002 08:30	AmtRec:	#Containers: 1					Scr Rst: Alpha: Beta:	

Comments: Samples were muffled overnight. 12-06-02 Gek
Sample #4 FDMN0-1-AC-C was tipped and lost ~10%. 12-06-02 Gek
Samples were converted 3x w/ con HCl. 12-06-02 Gek

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDH591AC-SAMP Constituent List:

U-232	RDL:	pCi/g	LCL:20	UCL:105	RPD:35	U-234	RDL:1	pCi/g	LCL:	UCL:	RPD:
U-235	RDL:1	pCi/g	LCL:	UCL:	RPD:	U-238	RDL:1	pCi/g	LCL:	UCL:	RPD:

FDMN01AA-BLK:

U-232	RDL:	pCi/g	LCL:20	UCL:105	RPD:35	U-234	RDL:1	pCi/g	LCL:	UCL:	RPD:
U-235	RDL:1	pCi/g	LCL:	UCL:	RPD:	U-238	RDL:1	pCi/g	LCL:	UCL:	RPD:

STL Richland

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

Richland Wa.

r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 1

WO Cnt: 4

Prep_SamplePrep v4.6

12/6/02 9:34:23 AM

Sample Preparation/Analysis

Balance Id:1120373922

7S Uiso PrpRC5013/RC5019, SepRC5079(5039)

Pipet #: _____

SR Uranium-234,235,238 by Alpha Spec

PRIORITY

Sep1 DT/Tm Tech: _____

Report Due: 12/11/2002

5I CLIENT: HANFORD

Batch: 2325529

pCi/g

Sep2 DT/Tm Tech: _____

SEQ Batch, Test: None

Prep Tech: WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
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FDMN01AC-LCS:

U-232 RDL: pCi/g LCL:20 UCL:105 RPD:35 Uranium RDL: pCi/g LCL:70 UCL:130 RPD:35

FDH591AC-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMN01AA-BLK:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMN01AC-LCS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

48

12/13/02 11:47:01 AM

ICOC Fraction Transfer/Status Report

ByDate: 11/13/02, 12/14/02, Batch: '2325529', User: 'All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting		Comments
2325529					
AC	CalcC	BELSITOB	11/27/02 3:29:50 PM		
SC		WagarR	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
SC		BELSITOB	InPrep	11/27/02 3:29:50 PM	RICH-RC-5013 REVISION 4
SC		BELSITOB	Prep1C	12/2/02 2:48:39 PM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	InPrep2	12/3/02 9:26:18 AM	RICH-RC-5019 REVISION 2
SC		WagarR	Prep2C	12/6/02 9:41:14 AM	RICH-RC-5019 REVISION 2
SC		WAGNERJ	Prep2C	12/6/02 9:41:44 AM	RICH-RC-5019 REVISION 2
SC		HAMMERL	InSep1	12/9/02 8:06:18 AM	RICH-RC-5079 REVISION 1
SC		HAMMERL	Sep1C	12/10/02 7:07:40 AM	RICH-RC-5079 REVISION 1
SC		McPHERONC	InSep2	12/10/02 7:09:04 AM	RICH-RC-5039 REVISION 3
SC		McPHERONC	Sep2C	12/11/02 11:38:09 AM	RICH-RC-5039 REVISION 3
SC		BlackCL	InCnt1	12/11/02 12:17:49 PM	RICH-RD-0008 REVISION 2
SC		BlackCL	CalcC	12/12/02 9:12:12 AM	RICH-RD-0008 REVISION 2
AC		BELSITOB	12/2/02 2:48:39 PM		
AC		WAGNERJ	12/3/02 9:26:18 AM		
AC		WagarR	12/6/02 9:41:14 AM		
AC		WAGNERJ	12/6/02 9:41:44 AM		Please remove WagarR. JW
AC		HAMMERL	12/9/02 8:06:18 AM		
AC		HAMMERL	12/10/02 7:07:40 AM		
AC		McPHERONC	12/10/02 7:09:04 AM		
AC		McPHERONC	12/11/02 11:38:09		
AC		BlackCL	12/11/02 12:17:49 PM		
AC		BlackCL	12/12/02 9:12:12 AM		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

11/21/2002 3:08:58 PM

Sample Preparation/Analysis

Balance Id:

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017

TA Gamma by HPGE

Pipet #:

Report Due: 12/11/2002

51 CLIENT: HANFORD

PRIORITY

Sep1 DT/Tm Tech:

Batch: 2325530

SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
--------------------------------------	-------------------	-----------------------------	------------------------	------------------------	--------------	--------------------	-------------------	----------------	---------------------------------	--------------------------

1 FDH5L-1-AE

J2K200322-1-SAMP

42.8

525

1000

65

12/4

0249

12/3/02

11/20/2002 09:25

AmtRec: LP,2X60G,20ML

#Containers: 4

Scr Rst:

Alpha:

Beta:

2 FDH59-1-AH

J2K200322-2-SAMP

44.9

62

0248

11/20/2002 08:30

AmtRec: LP,3X60G,20ML

#Containers: 5

Scr Rst:

Alpha:

Beta:

3 FDH59-1-AM-X

J2K200322-2-DUP

44.9

64

0339

12/4/02

11/20/2002 08:30

AmtRec: LP,3X60G,20ML

#Containers: 5

Scr Rst:

Alpha:

Beta:

4 FDMN6-1-AA-BX

J2K210000-530-MBLK

52.0

BLK Fine Ottawa sand

64

0250

12/3/02

11/20/2002 08:30

AmtRec:

#Containers: 1

Scr Rst:

Alpha:

Beta:

5 FDMN6-1-AC-CM

J2K210000-530-MLCS

26.61

CAL 3122

Y

12/18/02 676-2

0338

12/4/02

11/20/2002 08:30

AmtRec:

#Containers: 1

Scr Rst:

Alpha:

Beta:

Comments:

Recount dup on different detector

FDH59 12/2/02

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDH5L1AE-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:

STL Richland

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt,

Richland Wa.

r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 1

WO Cnt: 5

ICOC v4.5.3.2

11/21/2002 3:08:58 PM

Sample Preparation/Analysis

Balance Id:

AX Gamma PrpRC5013/5017

Pipet #: _____

TA Gamma by HPGE

Report Due: 12/11/2002

SI CLIENT: HANFORD

PRIORITY Sep1 DT/Tm Tech:

Batch: 2325530

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
Eu-155 RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						
FDMN61AA-MBLK:										
Co-60 RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-152 RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-155 RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						
FDMN61AC-MLCS:										
Cs-137 RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	K-40	RDL:--	pCi/g	LCL:70	UCL:130	RPD:35
Ra-226 RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	RA-228	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35
RA-228DA RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35	U-238	RDL:	pCi/g	LCL:70	UCL:130	RPD:35

FDH5L1AE-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMN61AA-MBLK:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMN61AC-MLCS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/5/02 2:14:52 PM

ICOC Fraction Transfer/Status Report

ByDate: 8/25/02, 12/6/02, Batch: '2325530', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
2325530				
AC	CalcC	BELSITOB	11/27/02 3:29:34 PM	
SC		WagarR	IsBatched 11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
SC		BELSITOB	InPrep 11/27/02 3:29:34 PM	RICH-RC-5013 REVISION 4
SC		BELSITOB	InPrep 11/27/02 3:29:37 PM	RICH-RC-5017 REVISION 3
SC		BELSITOB	Prep1C 12/2/02 2:48:23 PM	RICH-RC-5013 REVISION 4
SC		BELSITOB	Prep1C 12/2/02 2:48:26 PM	RICH-RC-5017 REVISION 3
SC		DAWKINSO	InCnt1 12/2/02 4:33:23 PM	RICH-RD-0007 REVISION 3
SC		BlackCL	CalcC 12/5/02 10:24:58 AM	RICH-RD-0007 REVISION 3
AC		BELSITOB	11/27/02 3:29:37 PM	
AC		BELSITOB	12/2/02 2:48:23 PM	
AC		BELSITOB	12/2/02 2:48:26 PM	
AC		DAWKINSO	12/2/02 4:33:23 PM	
AC		BlackCL	12/5/02 10:24:58 AM	

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

12/3/02 9:20:39 AM

Sample Preparation/Analysis

Balance Id:1120373922

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.CH Sr-Total PrpRC5013, SepRC5006
TH Total Strontium by GPC
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 12/11/2002

PRIORITY

Sep1 DT/Tm Tech: 12/14/02

3:50 PM

Batch: 2325531 SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH5L-1-AC J2K200322-1-SAMP	6.02g,in		SRTA8222 10/03/02 09/19/02 r							10/11/02 B
11/20/2002 09:25		AmtRec: LP,2X60G,20ML	#Containers: 4					Scr Rst:	Alpha: 1.88E+01 pCi/g	Beta: 6.70E+01 pCi/g
2 FDH59-1-AD J2K200322-2-SAMP	6.02g,in		SRTA8432 11/18/02 09/19/02 r							
11/20/2002 08:30		AmtRec: LP,3X60G,20ML	#Containers: 5					Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDH59-1-AN-X J2K200322-2-DUP	6.0g,in		SRTA8442 11/18/02 09/19/02 r							
11/20/2002 08:30		AmtRec: LP,3X60G,20ML	#Containers: 5					Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
4 FDMPE-1-AA-B J2K210000-531-BLK	6.0g,in		SRTA8452 11/18/02 09/19/02 r							
11/20/2002 08:30		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:
5 FDMPE-1-AC-C J2K210000-531-LCS	6.0g,in		STSB0649 09/16/02 06/03/02 r							
11/20/2002 08:30		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:

Comments:

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDH5L1AC-SAMP Constituent List:

Sr-90 RDL:1 pCi/g LCL:70 UCL:130 RPD:35

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2
Richland Wa. r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 1

WO Cnt: 5
Prep_SamplePrep v4.6

12/3/02 9:20:40 AM

Sample Preparation/Analysis

PRIORITY

Balance Id:1120373922

CH Sr-Total PrpRC5013, SepRC5006

Pipet #:

TH Total Strontium by GPC

Report Due: 12/11/2002

SI CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 2325531

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
FDMPE1AA-BLK:										
Sr-90	RDL:1	pCi/g	LCL:	UCL:	RPD:					
FDMPE1AC-LCS:										
Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35					
FDH5L1AC-SAMP Calc Info:										
Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
FDMPE1AA-BLK:										
Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
FDMPE1AC-LCS:										
Uncert Level (#s): 2		Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					

12/11/02 2:12:41 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/11/02, 12/12/02, Batch: '2325531', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
2325531				
AC	CalcC	BELSITOB	11/27/02 3:29:54 PM	
SC		WagarR	IsBatched	11/21/02 3:08:49 PM
SC		BELSITOB	InPrep	11/27/02 3:29:54 PM
SC		BELSITOB	Prep1C	12/2/02 2:48:44 PM
SC		WAGNERJ	InPrep2	12/3/02 8:54:41 AM
SC		WAGNERJ	Prep2C	12/4/02 8:44:06 AM
SC		FABREM	InSep1	12/4/02 3:29:50 PM
SC		FABREM	Sep1C	12/10/02 7:03:49 PM
SC		DAWKINSO	InCnt1	12/10/02 10:41:44 PM
SC		BlackCL	CalcC	12/11/02 10:38:50 AM
AC		BELSITOB	12/2/02 2:48:44 PM	
AC		WAGNERJ	12/3/02 8:54:41 AM	
AC		WAGNERJ	12/4/02 8:44:06 AM	
AC		FABREM	12/4/02 3:29:50 PM	
AC		FABREM	12/10/02 7:03:49 PM	
AC		DAWKINSO	12/10/02 10:41:44 PM	
AC		BlackCL	12/11/02 10:38:50	

55

AC: Accepting Entry; SC: Status Change

STL Richland
Richland Wa.

11/21/2002 3:08:59 PM

Sample Preparation/Analysis

Balance Id:

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 12/11/2002 W03809

PRIORITY

Sep1 DT/Tm Tech:

Batch: 2325532 SOIL mg/kg

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH5L-1-AA J2K200322-1-SAMP										
11/20/2002 09:25			AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:		Alpha:		Beta:
2 FDH5L-1-AF-S J2K200322-1-MS										
11/20/2002 09:25			AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:		Alpha:		Beta:
3 FDH5L-1-AG-X J2K200322-1-DUP										
11/20/2002 09:25			AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:		Alpha:		Beta:
4 FDH5L-1-AH-S J2K200322-1-MS										
11/20/2002 09:25			AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:		Alpha:		Beta:
5 FDH59-1-AA J2K200322-2-SAMP										
11/20/2002 08:30			AmtRec: LP,3X60G,20ML	#Containers: 5		Scr Rst:		Alpha:		Beta:
6 FDMPN-1-AA-B J2K210000-532-BLK										
11/20/2002 09:25			AmtRec:	#Containers: 1		Scr Rst:		Alpha:		Beta:
7 FDMPN-1-AC-C J2K210000-532-LCS										
11/20/2002 09:25			AmtRec:	#Containers: 1		Scr Rst:		Alpha:		Beta:

11/21/2002 3:08:59 PM

Sample Preparation/Analysis

Balance Id:

DW Alkaline Digestion by method 3060A

EA Chromium, Hexavalent (7196A)

PRIORITY

Pipet #:

Report Due: 12/11/2002

SI CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 2325532

mg/kg

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
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Comments:

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDH5L1AA-SAMP Constituent List:

FDH5L1AF-MS Constituent List:

FDH5L1AH-MS:

FDMPN1AA-BLK:

FDMPN1AC-LCS:

FDH5L1AA-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDH5L1AF-MS Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDH5L1AH-MS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMPN1AA-BLK:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDMPN1AC-LCS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/13/02 12:54:36 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/13/02, 12/14/02, Batch: '2325532', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
2325532				
AC	Sep2C	ManisD	12/4/02 9:00:55 AM	
SC		WagarR	IsBatched 11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
SC		ManisD	Sep1C 12/4/02 9:00:55 AM	RICHWC5005 REV6
SC		ManisD	Sep2C 12/4/02 3:30:40 PM	RICHWC5005 REV6
SC		OConnellD	Rev2C 12/13/02 12:53:09 PM	RICHWC5005 REV6
SC		ManisD	Rev1C 12/13/02 3:30:20 PM	RICHWC5005 REV6
AC		ManisD	12/4/02 3:30:40 PM	
AC		OConnellD	12/13/02 12:53:09 PM	
AC		ManisD	12/13/02 3:30:20 PM	

AC: Accepting Entry; SC: Status Change

STL Richland
Richland Wa.